PATENT SPECIFICATION

DRAWINGS ATTACHED

1,194,046

1,194,046

Date of Application (No. 35830/67) and filing Complete Specification: 4 August, 1967.

Application made in Italy (No. 774733) on 10 August, 1966.

Complete Specification Published: 10 June, 1970.

Index at Acceptance:—A6 M8B.

International Classification:—A 63 b 23/00.

COMPLETE SPECIFICATION

Exercising apparatus

I, GUIDO CARNIELLI, of Italian Nationality, of 28, Piazzale Luigi di Savoia, Milan, Italy, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention is generally concerned with an exercising apparatus of the stationary bicycle type.

Exercising apparatuses of the type referred to above are well known and made use of for exercising the lower limbs. They are principally intended for hospital patients but are also widely used in home exercising and training. Generally exercising apparatus of the above type comprises a frame constructed to resemble a cycle frame, and including front and rear supporting members resting on the ground or attached to a base, the frame carrying a saddle, handlebar, and crank axle in the usual positions, the crank axle being provided with or drivingly connected to a fly wheel combined with adjustable braking means so that the user can vary the resistance according to his need. Various types of such apparatus have been described and shown, for example, in the British Patent Specifications Nos. 432,220 and 479,945 and also in the British Patent Specification No. 936,469 of the inventor of this invention.

Such known exercising devices are acknowledged to be very efficient as far as exercising the lower limbs is concerned. During the exercise the saddle and the handlebar are stationary and, as a consequence thereof, the muscles and joints of the upper limbs, the waist, the chest and shoulders are stationary, whilst being physically exerted and stressed. Such an unfavourable condition is however typical of cycling.

The principal object of this invention is to provide an apparatus of this kind, which is not subject to the above and other limitations.

According to the present invention an exercising apparatus comprises a stationary frame, mounted on which are a handlebar, a saddle, a crank axle driven by means of cycle pedals drivingly connected to a fly wheel, adjustable braking means and a reciprocating handlebar supporting structure movably mounted on said frame and having its upper end secured to the handlebar and its lower end hingedly connected to the frame for pivotal movement about an axis parallel to and spaced from the axis of the crank axle, said reciprocating handlebar supporting structure being driven in reciprocating motion by means of a linkage and gear means comprising a driving gear secured to the crank axle and a driven gear which actuates the linkage, the number of teeth on said driving gear being an exact submultiple not greater than one third of the number of teeth on said driven gear.

Preferably said linkage comprises a connecting rod one end of which is pivotably connected to the reciprocating handlebar supporting structure and the other end of said rod being journalled to an eccentric drivably connected to the driven gear.

Advantageously the reciprocating supporting structure is pivotally connected to said frame so that during reciprocation the handlebar moves downwardly as its distance from the saddle increases.

Clutch means may also be provided for disengaging the crank axle from the reciprocating handlebar supporting structure so as to allow rotation of the pedals without causing reciprocating motion of the handlebar.

One embodiment of the invention will

now be described by way of example only with reference to the accompanying drawings, in which:

Figure 1 is a simplified side elevation of a preferred embodiment of the invention;

Figure 2 is a side elevation showing the linkage in detail;

Figure 3 is a view from above and a partial horizontal cross-sectional view of the linkage and gear means, and

Figure 4 is a sectional view of the clutch means.

Referring firstly to Figure 1, there is shown an exercising apparatus comprising a stationary frame, generally indicated at 11, which is provided with front and rear supporting members 10 resting on the ground, a saddle 12 and a crank 13 including a crank axle 14 and pedals 15. Said crank axle 14 is drivingly connected, by means of a V-belt, to a fly wheel 16 which is provided with adjustable braking means (not shown) to provide a variable resistance to the movement of the pedals. The saddle is supported by a conventional saddle pillar and its height from the ground is adjustable.

The above structural components have not been shown in detail and will not be particularly described as they comprise current knowledge of the art and do not form a part of this invention, the essential features of which are as follows.

The improved apparatus is provided with a conventionally formed handlebar 17 having suitably located handgrips, and secured to the upper ends of a reciprocating handlebar supporting structure 18. Such a structure is formed of tubular metal and provided with conventionally constructed adjusting means for adjusting the height of the handlebar. The lower end portion of said reciprocating handlebar structure 18 is pivotally connected at 19 to the stationary frame, so that said structure 18 together with the handlebar 17 can be oscillated about an axis at 19 as indicated by arrows A and B, (in Figure 1), between positions indicated by 17′ and 17″. It will be noted that the pivotal axis at 19 is near to the axis of crank axle 14, so that as the handlebar is moved away from saddle 12, that is in the direction indicated by the arrow B, it will also move downwardly.

Reciprocation between A and B of the handlebar has been proved to be extremely effective in promoting deep and correct breathing, in particular when the upward motion in the direction of arrow A is accompanied by bending of the user's arms. The movement of the handlebar in the direction of arrow B towards 17″ assists the exhaustion of air from the user's lungs.

The reciprocating handlebar supporting structure 18 has an arm 21 fixedly secured thereto, and one end 20′ (Figure 2) of a connecting rod 20 is pivotally connected to said arm 21. The other end of the connecting rod 20 is journalled about an eccentric 22 supported and connected for rotation about a shaft 23, geared to the crank axle 14 of the pedals 15, by means of gears 24 and 25. According to an important feature of the apparatus, the number of teeth of the driving gear 24, connected to crank axle 14, is an exact submultiple of the number of teeth of driven gear 25, connected to eccentric 22, so that a constant reciprocating motion is set up between the motion of pedals and of the handlebar, that is between the motions of lower and upper limbs respectively, so as to obtain correlation between the physical exercise and the breathing frequency. It has been found that an advantageous ratio between the number of teeth of gear 24 and of gear 25 is one to three.

The various components of the gear means and linkage can be suitably journalled and protected inside a case such as indicated at 26.

In order that a user may perform an exercise consisting of pedalling after the manner of cycling, whilst the handlebar remains stationary with respect to the saddle, clutch means are provided for disengaging the crank axle 14 from the reciprocating handlebar supporting structure.

Figure 4 illustrates an example of construction of said clutch means. The eccentric 22 is supported for free rotation about shaft 23, to which gear 25 is keyed, and a radially slidable pin 28 is located for radial displacement into a radial bore in shaft 23, upon axial displacement of an axial pin 29 connected to a push button 30. Outward displacement of pin 28 leads to its engagement into another bore provided in eccentric 22, to connect the eccentric to the shaft.

WHAT I CLAIM IS:—

1. An exercising apparatus comprising a stationary frame, mounted on which are a handlebar, a saddle, crank axle driven by means of cycle pedals drivingly connected to a fly wheel, adjustable braking means and a reciprocating handlebar supporting structure movably mounted on said frame and having its upper end secured to the handlebar and its lower end hingedly connected to the frame for pivotal movement about an axis parallel to and spaced from the axis of the crank axle, said reciprocating handlebar supporting structure being driven in reciprocating motion by means of a linkage and gear means comprising a driving gear secured to the crank axle and a driven gear which actuates the linkage, the number of teeth on said driving gear being an exact submultiple not greater than one third of teeth on said driven gear.

2. An exercising apparatus as claimed

in claim 1 wherein said linkage comprises a connecting rod one end of which is pivotably connected to the reciprocating handlebar supporting structure and the other end of said rod being journalled to an eccentric drivably connected to the driven gear.

3. An exercising apparatus as claimed in claims 1 or 2, wherein the reciprocating supporting structure is pivotally connected to said frame, so that during reciprocation the handlebar moves downwardly as its distance from the saddle increases.

4. An exercising apparatus as claimed in claims 1, 2 or 3, wherein, clutch means is provided for disengaging the crank axle from the reciprocating handlebar supporting structure so as to allow rotation of the pedals without causing reciprocating motion of the handlebar.

5. An exercising apparatus substantially as herein described with reference to the accompanying drawings.

For the Applicant:
CHATWIN & COMPANY,
Chartered Patent Agents,
253 Gray's Inn Road,
London, W.C.1.

Printed for Her Majesty's Stationary Office by The Tweeddale Press Ltd., Berwick-upon-Tweed, 1970.
Published at the Patent Office, 25 Southampton Bdings, London, WC2A 1AY, from which copies may be obtained.